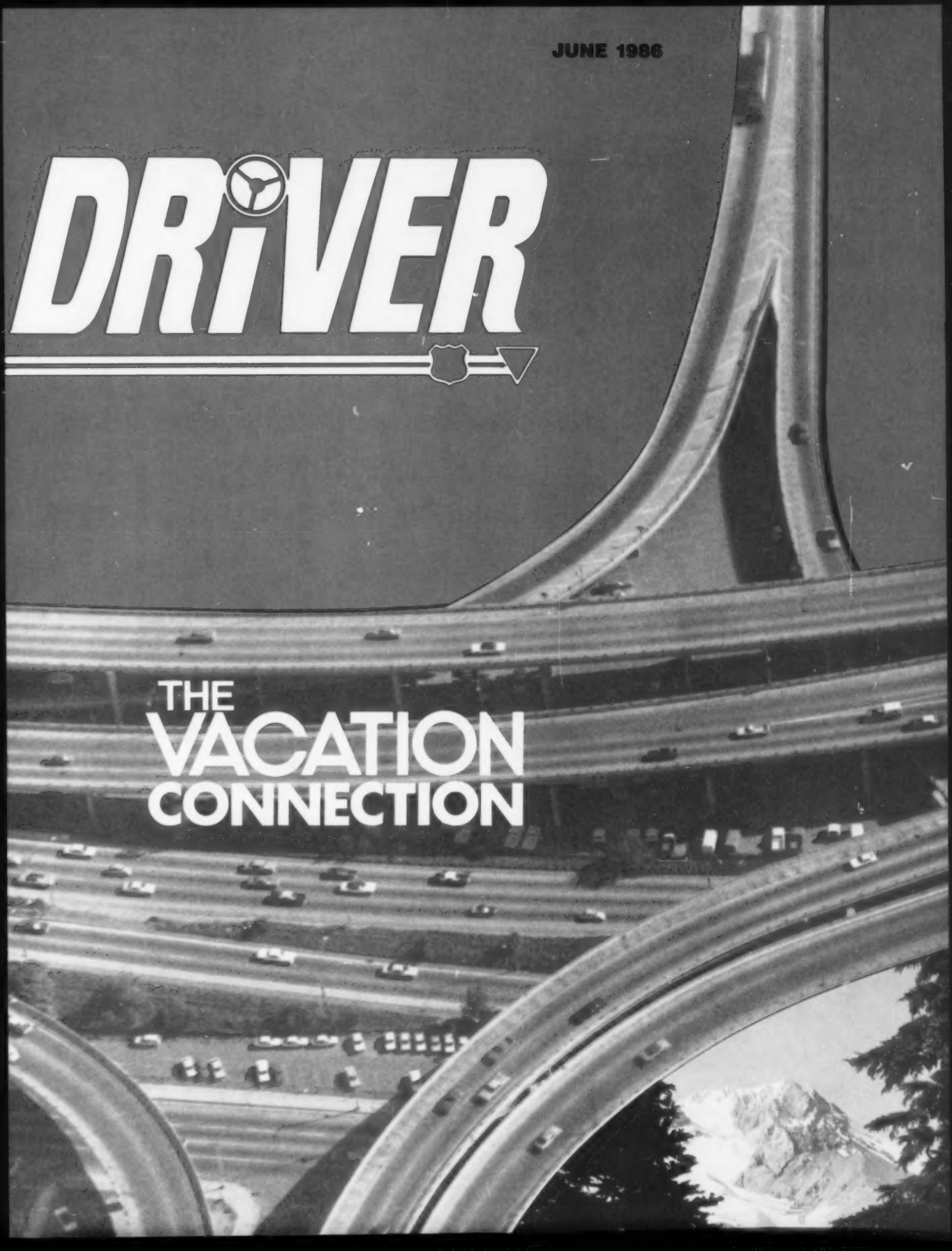
JUNE 1986

DRIVER



THE VACATION CONNECTION

THE AMERICAN FAMILY SUMMER VACATION

....and RELATED HORRIFYING EXPERIENCES

If you belong to an auto club, visit the local office for help in planning a vacation route that will allow time for sightseeing and adequate rest along the way. They can also provide you with maps, and information on road conditions and good motels.

What's your favorite hard-luck vacation story? Is it the time you took the entire family on a car trip to Yellowstone, and all the kids got the German measles? Is it the time you got lost in a dangerous part of a large city while looking for a public bathroom where you wouldn't be knifed? Is it the time your car was totaled by some guy who ran a stop sign in a small town 1000 miles from home? Or is it just the usual hazards of family vacations — carsick kids, bad meals, blowouts, no vacancy signs?

Put another way, did the movie "National Lampoon's Vacation" bring back memories (perhaps painful ones) for you? We have all been on family vacations like that, where the trip seemed to go on forever and nothing went right, although most of us have to recall several different vacations to get as many "horror stories" as there were in that film.

Here, we're going to recall some assorted true stories, using the examples

continued

A flush and refill of the radiator before the vacation is a good idea, too. The coolant container will tell you the proper ratio of coolant and water.

DRIVER

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both to entertain and to make a few points. Please write and tell us your own worst stories of the Great American Vacation.

THE CAR

Let's face it; automobiles are very forgiving. You can neglect them and they will take it and still run. But if you neglect them too long they'll turn on you. For those of you who don't like to court disaster, we deal with car maintenance for the vacation in a companion feature on page 8. For those who want to live dangerously, read on.

Just how long can you neglect the car? An example:

A lone driver in a six-year-old car found out that by leaving the cooling system to itself for a long period he could get himself stranded on the highway outside a large city 1000 miles from home. He had never replaced the radiator hoses on the car, and they decided vacation time was a good time for them to blow. Actually, he was fortunate he was in a large city rather than out in the middle of the plains he had just driven through. Towing and repair, although expensive, was not so bad as it might have been out in the country somewhere.

Neglecting the car will only bring you pain. Again, see the maintenance feature.

THE VACATION PLAN

A well-planned trip can be a pleasure, allowing the travelers the time to see the country and to have a relaxing break from the pressures at work. On the other side of things, a poorly-planned vacation is a two-week ordeal that you won't soon forget, no matter how hard you try. It might

continued

Listen to the kids when they ask you to stop. Give yourself a break from the wheel regularly, even if you don't have to stop for gas or food. Get out, stretch and move around. Then you can go again, relaxed, refreshed and alert.

(right)
Your pre-trip maintenance should include special attention to the car's cooling system. Squeeze the hoses to check their condition — they should be firm, not brittle or soft. Replace bad hoses now, or they might fail during the hard driving ahead.

(below)
If you're still driving after dark on a summer vacation, you have been driving too long. Limit yourself to eight hours on the road each day, including stops for gasoline and meals. More than that would be pushing too hard.

be something you'll laugh about later, but while it's going on you'll hate it.

For one family vacation, the father got what seemed like a great idea, to start out *very* early so he could get across the plains before the heat of the day set in. He designated 2 a.m. as wake-up time and 3 as "lift-off," figuring the kids would sleep through the early part of the trip, leaving him with some peace.

However, he had forgetten to get the cash for the trip, and he had to drive back to town to wait for the bank to open. The family's vacation start was delayed to 9.

That was a minor planning error. Here's a more serious one.

A lone vacationer took two weeks off work. He wanted only to get away from work and on the road; he didn't even want to think. Therefore, he made no plans except to get a few maps and some traveler's checks, calling it a "spontaneous" vacation. He told nobody where he was going, and took off the next morning to see the Grand Canyon, 600 miles away.

He arrived late in the evening, having driven straight through. Of course, at that time of year, toward the end of the tourist season, all the motels anywhere near the canyon filled up early in the day. After a couple of hours of "no vacancy" signs he finally had to backtrack 50 miles to find an open room. He collapsed on the bed shortly before midnight, and the next day had a long commute for sightseeing.

A better way: Plan your trip. First, plan the distance you will go, based on the time you have available. Include plenty of time to relax and see the sights along the way. Give yourself at least one day at home at the end of the trip before you

continued

Trailer Notes

Some of the negative experiences of vacationing can be eliminated by those who take a trailer on their summer trips. The savings in motel and restaurant bills could more than make up for the cost of the extra gasoline it takes to pull a trailer.

A fully-equipped trailer provides space and facilities to cook, eat and sleep, but with these conveniences come additional responsibility. Use of a trailer requires care and attention to safety.

Here we'll assume you have the proper tow vehicle for your trailer and the proper equipment on the tow vehicle. Check the manufacturer's specifications and owner's manuals for both the trailer and the tow vehicle to make sure.

We'll give you just a few tips on vacationing with a trailer.

First, the trailer has to be loaded so the weight is balanced on all the axles. Only 10 to 15 percent of the trailer's total weight should be on the trailer tongue. Weigh the entire trailer and then just the hitch on a commercial truck scale. If the tongue weight is in the proper range, you're ready. If not, you will have to shift some of the cargo forward or back until the tongue weight is right.

When you pack the trailer for the trip, balance the weight for the proper hitch weight and don't load the trailer higher than its capacity. Too much weight in the front will cause an overloaded hitch and braking trouble. Too much weight in the rear can cause the trailer to sway — an extremely dangerous situation.

Also, balance the load side-to-side, because this will make the trailer ride more stable. Put heavy things down low and toward the front of the trailer. This keeps the center of gravity low, provides more stability in curves and keeps heavy objects from falling out of overhead storage during severe cornering. Pack everything you can into the trailer's cabinets and pad it with blankets and clothing.

Keep things you need frequently and emergency supplies in easy-to-reach places.

Pulling a trailer puts a strain on a car. A heavy trailer may decrease your gas mileage 40 to 50 percent, climbing ability by 50 to 75 percent and top speed by up to 50 percent. Your acceleration time will be doubled. Therefore, to avoid strain on the tow vehicle and its engine, accelerate slowly and shift smoothly. Try to maintain your momentum and stay out of stop-and-go traffic whenever you can.

On hills, keep the car in low gear. Build up speed as you approach the hill to give you the momentum to get over the top. On the downhill side, keep the car in low to aid in braking. Overuse of the brakes on long hills could cause them to overheat and fail.

Remember that the trailer doesn't travel in the same curve as the car, so make a wide turn with the car to accommodate the trailer and to avoid running over a curb.

Stay out of high winds when pulling a trailer. Winds can cause a trailer to sway or even overturn.

If swaying occurs, keep off the car's brakes. The National Safety Council recommends speeding up just a little to get the trailer to straighten out, or applying *only* the trailer brakes while speeding up a little. If you're going downhill, skip the acceleration and just use the trailer brakes. Stop, check out the cause of the swaying and get it fixed right away.

Because of the weight of the car and trailer combination, and the difficulty in getting stopped quickly, never follow closely when hauling a trailer. The "two second rule" for allowing space between you and the car ahead should be extended to a "four second rule" when pulling a trailer.

If your car and trailer are passed by a large vehicle, like a semi, move as far to the right as you can, and make sure your car is *pulling* (that you are not coasting). This will minimize the chance of swaying caused by the wind from the large vechicle. If you ever pass another vehicle while pulling a trailer, remember the extra length you have behind you and the extra time it takes you to accelerate. Give yourself plenty of room to complete the pass. If traffic backs up behind your slow-moving trailer, pull off the road to let the cars pass.

Backing a trailer is very tricky so avoid it whenever you can. The trailer backs up in the opposite direction from the way the rear of your car is going. When you back a trailer, put your hand on the bottom of the steering wheel; the rear of the trailer will go in the same direction as your hand.

We remind you again to read the owner's manuals, which is the best way to avoid unforeseen difficulties.

Do you have some organized activities for the kids to do? Better think about it, or they might drive you nuts fighting and bickering among themselves.

go back to work, to recover from the vacation.

Now, a good rule is to limit yourself to eight hours on the road each day — and that includes all stops for gasoline, restrooms and meals. Any longer than that and you're pushing yourself too hard.

With these things in mind, plan your trip. Plot it out on a map, showing the end points for each day's drive. Be reasonable; allow extra time in case of any delays or emergencies (another reason to limit the hours on the road).

If you belong to an auto club, a good idea is to have them assist you. They can provide detailed maps, tour guides and information on the road conditions you will encounter ahead. They can also give you telephone numbers for their offices along the way, in case you require assistance.

Another good idea is to call for road and weather information while you're on

Avoid heavy meals while you are traveling because they will only weigh you down and make you sleepy. Instead, eat smaller meals, and stop more frequently for coffee breaks.

Towing a trailer allows you to go to different places, and it enables you to save on motels and meals.

the road. The highway patrol or the weather service can tell you what to expect.

Along with your other advance planning, you can call ahead for motel reservations. This will prevent the extra driving that our friend endured.

An important tip: Tell some friends where you are going and where you will be each night. That way, if there's an emergency at home they can contact you. If you notify friends along the way approximately when to expect you, they can be prepared for you (and they can call the authorities if you're overdue).

Remember your packing. Take the minimum of clothing that you can, because you usually don't wear everything you take, and you will find laundromats along the route anyway. Take all the documents you may need — driver's license, registration, proof of insurance, leave papers. Take enough money for the trip, although credit cards and traveler's

continued

PREVENTING CAR TROUBLE

Nothing can turn a good vacation into a horrifying experience as quickly as car trouble. However, most car problems can be prevented by taking a little time to check the car for common trouble spots.

Before going anywhere, check the tires, including the spare. Make sure they have a decent amount of tread. If wear bars (bald patches across the tread which show up when the tread is under 1/16-inch deep) are showing or the tires show other signs of damage such as cracks, cuts or bulges, replace the tire.

Check the car's fluid levels. Start with the easy ones, like wiper fluid, oil and radiator fluid. Don't forget to check the owner's manual to find out how often oil and radiator fluid should be changed. The owner's manual will also have instructions for checking brake, transmission, and power steering fluids.

Another common problem is an overheated engine. To reduce the chances of the engine overheating, all that is needed is a quick look under the hood.

First, check the radiator hoses. If the hoses are in good condition, they should be firm, but not overly hard. To find out what a good hose should feel like, check a new radiator hose at a local auto supply store. If the hoses are spongy, cracked, overly hard or have any bulges, they should be replaced.

Replacing the hoses is not as difficult as many people believe. Allow the engine to cool down. Remove the radiator cap. Check the cap to make sure the gasket is in good shape and the spring works properly. If the cap needs replacing, be sure to get a cap rated at the same pressure.

After checking the cap, drain the radiator by opening the valve at the bottom of the radiator. Remove the clamps from each end of the hose. If they are difficult to remove, cut them off with a tin snip or a sturdy scissors. The hose should then come off with a firm pull. If it doesn't, carefully cut the end of the hose. Take the hose to an auto parts dealer and get a matching hose to replace it. When putting the new hose on, use new hose clamps and tighten them as firmly as possible.

After the hoses have been checked, take a look at the drive belts. If a drive belt fails, whatever accessory it runs also will fail. The belt should be tight, and should not give more than ½ to ¾ of an inch. Make sure that the belt is not cracked, oil-soaked or worn looking.

To replace a bad belt, first determine which accessory it drives. When the accessory is located, it will either be on an adjustable mount or it will have an adjustable idler pulley. There are generally one pivot (stationary) and one adjustment bolt which need to be loosened. After they are loosened, pull up on the belt. This will put the adjustment to the minimum distance. Remove the belt.

When putting on the new belt, place the belt in the pulley grooves. Using a lever, such as a crow bar, push the accessory into the proper position (where the belt is properly snug). Take care not to pry on points where either the engine or the accessory can be damaged. Belt dressings are available at many auto parts stores, and they can extend the life of the drive belts. If the belts slip but have enough tension, a belt dressing will also stop the slippage.

Even if everything looks fine, you should carry certain tools and spare parts on the trip. The following list is the one recommended by the Backyard Mechanic.

- jack
- spare tire
- ⅜ to ½" plywood board to support jack
- lug wrench
- work light
- wrenches
- screwdrivers, phillips & slot-head
- locking pliers
- flashlight
- points & condenser (if your car uses them)
- fuses
- spare lower radiator hose
- spare drive belt for alternator/water pump
- epoxy sealer and silicone gasket for fluid leaks
- electrical tape
- wire
- jumper cables
- fire extinguisher
- flares or triangles
- oil, coolant and other fluids

Take a few simple precautions now, and you'll keep your vacation from becoming another tale of woe.

checks are probably better than a big wad of cash.

Loading the car should also be part of your planning. If you have passengers, give them plenty of room (especially if they're children). Distribute the load evenly — don't put everything heavy (luggage or people) toward the back. Keep luggage and people out of your view to the rear as much as possible.

Finally, always wear your seat belts, and make sure the passengers also buckle up. A good plan anytime.

THE KIDS

While on vacation, your children are interested only in two things. These are 1) reaching the destination of the trip, and 2) activities — things to do in the meantime. Kids are not interested in the travel portion of the trip, only in getting out of the car — to run and play, to eat or just to visit the bathroom. Therefore the time between starting and stopping the car is dead time to them and they become bored.

The longer they have to sit inside the car, the more they fidget and squirm, the more they fight with their brothers and sisters, and the more they drive their parents nuts. Such goings-on can distract parents from the road, and they can make the trip seem longer and much less pleasant.

An example: Forced to sit in the car for hours on family vacations, the kids had to think of ways to entertain themselves, things like singing. They liked "100 Bottles of Beer on the Wall," and other repetitive songs. After a few choruses of such "fine music," Dad got annoyed and told them to shut up. They were quiet for a short time, but they got bored and started picking fights with each other. Then Dad got really angry and warned them they'd regret it if he had to stop the car to break up the combatants. After making the same warning several times, he finally had to stop the car and let them out.

It is to your own advantage to keep the little ones occupied and reasonably happy. The trick is to give them something to do that won't require a lot of movement, something that will keep them moderately quiet (complete peace and quiet is probably out of the question). That means you will probably have to get involved and direct the kids' activities.

Activities which require them to watch the road are good. Tell the kids to tally

Give yourself time along the way for sightseeing on your trip. In addition to providing a much-needed break from driving, it's also a very pleasant way to spend time, which is the whole idea behind a vacation.

all the out-of-state license plates they can find, or to look for certain hard-to-find words on road signs. You can get involved and play word games with them like "20 Questions" or "Who Am I?" or any others you can think of. When you want them to be totally quiet, you can have them read or color.

Now, as to their requests for you to stop for every imaginable reason, you should listen to them — about every couple of hours. Even if you don't need to stop for gas or food, get out and stretch, let someone else take the wheel, and then go again. Your children will be happier for the break from the car and you might be surprised that you are happier and more comfortable too.

THE UNEXPECTED PROBLEMS

Unexpected difficulties and emergencies can ruin a vacation (if they were expected, they would cause no trouble at all). Of course you can't plan for every possible occurrence, but try to be prepared for surprises.

One good way, of course, is to carry in the car a few basic tools and some spare engine oil and other fluids. If the car is in good running order (see the maintenance article, page 8) most problems should be minor.

Not all problems can be fixed with a screwdriver, however. An example:

After a long trip of over 900 miles, the family finally reached Yellowstone National Park. That night, all four children came down with German measles, first the three sons and then the daughter, who was also suffering from allergic reactions to every living thing in the park. Visits to Old Faithful were delayed while the kids were recuperating, and the sightseeing was severely limited.

It was a minor problem, but it points out the fact that anything can happen on a vacation. Here's a more dramatic example.

The family was at the halfway point of their trip to northern California, out in

continued

(right)
Make sure you have all the important papers you will need for the trip, along with your credit cards, checkbook or traveler's checks, and some maps and tour guides for your vacation area.

(below)
Because of the difficulty of backing a trailer, avoid it whenever possible. Park so that you can drive forward to get out.

the middle of Nevada. In a very small town at a minor intersection controlled by a stop sign, their car was hit broadside by a full-sized sedan. The car was totalled, and the vacation was brought to a quick halt. Fortunately, the insurance covered all the expenses of continuing the trip, getting a new car, and medical bills for minor injuries to one of the children.

The statistics show most accidents happen within 25 miles of home, but they do occur in far-away places. In case of emergencies like these, and for other problems like the sickness we mentioned, have telephone numbers handy for the highway patrol for the areas you'll be traveling through, as well as the local office of your auto club. It's a good idea to have your car insurance paid up, and to carry a first aid kit.

THE GLAZED EYES

Driving too long without a break is extremely dangerous. At worst, you might fall asleep behind the wheel. Almost as bad is being "hypnotized" by the road — your eyes are open but you're not fully alert and ready to handle emergencies. An example:

The "lone ranger" driver on his trip to the Grand Canyon decided later that same trip to visit relatives who lived over 600 miles away. As he cruised up through Arizona and southwest Colorado, he figured he could reach his destination in plenty of time for dinner. But he had forgotten how distant his destination was, and how long traveling takes on winding, two-lane highways. When he finally reached his family's house, they were surprised to see him, and he was surprised to have made it. He had nearly lost consciousness several times, and

(above, right)
Long drives through stretches of fairly uninteresting countryside can lull you into a state of hypnosis, where your eyes are open but your mind is not fully alert. Avoid this problem by taking frequent breaks, talking to the passengers and listening to the car radio.

once found himself driving on the shoulder of the road, with no idea how he'd got there.

Once again, this is bad planning. You must know your limitations, and plan your drive within those limits. If you drive too far, no matter how young or strong or "macho" you are, you'll lose efficiency. Or you'll even fall asleep. You're not really ready to cash your chips in, are you?

You should stop at regular intervals, whether or not it's time for gas or a meal. Get out and move around, doing a little light exercise and stretching. This will restore your alertness.

When you eat, skip anything heavy and anything that causes you to be drowsy. An occasional cup of coffee will help keep your mental edge sharp, but even caffeine won't take the place of rest.

Once you start to become drowsy, you *must* stop. If the feeling is caused by boredom and monotony, coffee and a little exercise will help. However, if you've been on the road for ten hours you need sleep, and you should get it.

If there is more than one person to do the driving you can take turns, one driving while the other rests. Even so, there is a limit to the distance you can travel because riding in a car can be as tiring as driving it. Don't assume you can drive around the clock by taking turns sleeping.

Other good ways to prevent drowsiness include listening to the radio and talking with your passengers.

We hope the information in this article has helped you to prepare for your driving vacation and to avoid the foreseeable hazards of the road. Have a nice trip!

Old Grey Bites The Dust

by CTOC (SW) Ron L. Lunsford, USN
Skaggs Island, Calif.

All was safe and sound aboard a California naval station early one foggy morning. About 0500 a gate guard on break took the keys to what is referred to as Old Gray, a haze gray Ford Econoline van that has performed faithfully for over 100,000 miles. Old Gray was the workhorse of the Security Force. It chased speeders, responded to duress drills, and carried all the necessities required by a patrolman.

The van had just undergone a transmission overhaul and the police lights were to be installed that day. The relieving gate guard started Old Gray for his return to gate duty and buckled his seat belt. From

the administration building to the south gate is about three miles. The driver, a seaman, was fresh from a two-hour break, and all seemed safe.

The road to the south gate is potentially hazardous even on a clear day. The road has narrow shoulders, winds through farmland and sloughs, and the speed limit is 35 to 40 mph.

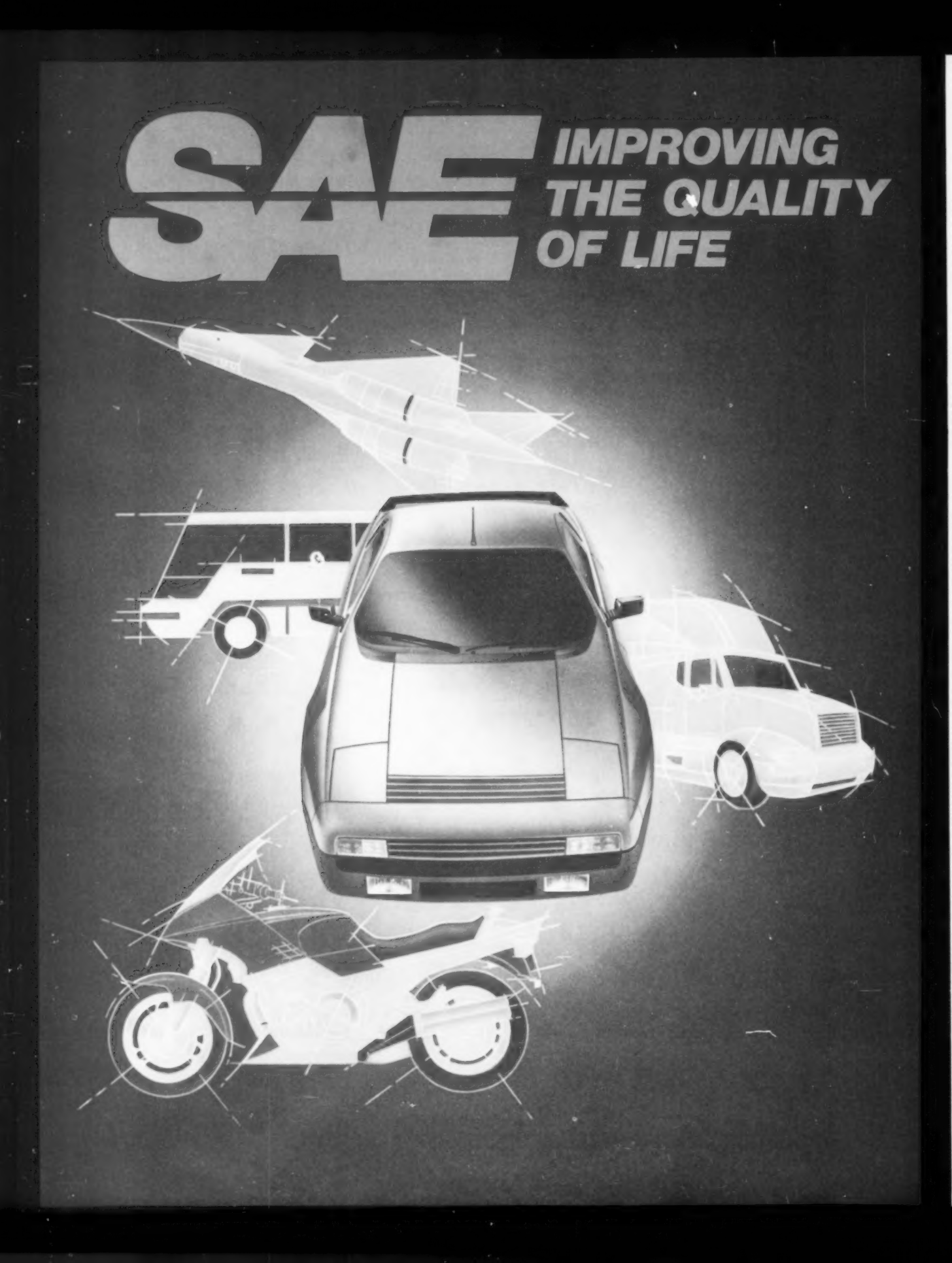
On this particular morning, the seaman was in a hurry. He was eager to complete the last two-and-a-half hours of his watch. He didn't pay attention to the tule fog that hovered about four feet to 10 feet off the ground, a sandwich of vision-impairing haze.

Our sailor was speeding. Skid marks documented by the California Highway Patrol indicated he left the road going 57+ miles per hour. The driver went into a left-hand curve too fast and slipped off the right of the roadway. Panic ensued, causing the driver to over-correct in an attempt to regain steering control.

The skid began as the van hurtled across the roadway, executing the vehicular equivalent of a one-and-a-half gainer by rolling over completely and crashing on its roof, reversing direction so that the south-bound vehicle was like an upside down turtle headed north. Windows in Old Gray cracked and disintegrated under the impact. Dirt and mud filled the air and the field was ripped by the rolling van. In fact, the hubcaps were left in the mud where the wheels slammed into it, marking each gouge as the van tumbled over.

The driver fared much better than the vehicle. Old Gray was totaled, but the driver was able to limp away, a little shaken but with only a bruised knee. As a result of wearing his seatbelt, he was able to assume his midwatch and then stand tall before his commanding officer for article 15 proceedings for reckless driving.

The moral of the story: Seatbelts save lives even when we don't use commonsense. Be safe and use both!


SAE
IMPROVING
THE QUALITY
OF LIFE

There are engineers that want to advance mobility to preserve and improve the quality of your life. They are the more than 47,000 members of the Society of Automotive Engineers (SAE) in more than 80 countries around the world.

SAE members represent nearly all engineering and scientific disciplines. Through the Society, these engineers with their diverse educational backgrounds combine their abilities to further the research, development, design, manufacture and utilization of land, sea, air and space vehicles.

These engineers coordinate their efforts in such related fields as: ■ aircraft ■ aerospace systems ■ space technology ■ passenger cars, trucks and buses ■ farm machinery ■ off-highway vehicles and construction equipment ■ engineering materials ■ fuels and lubricants ■ vehicle maintenance and operation ■ transportation safety ■ transportation systems ■ vehicle emissions ■ engineering education ■ science engineering relationships . . .

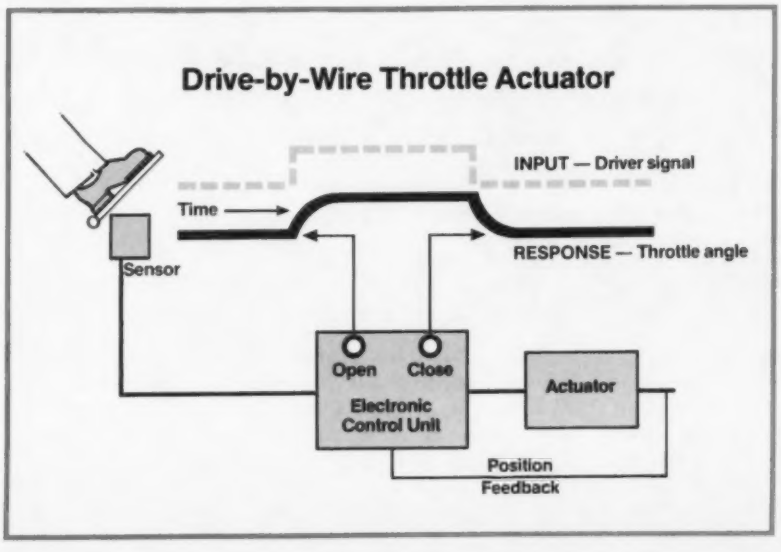
SAE's job, according to its constitution, is to "advance the Arts, Sciences, Standards, and Engineering Practices connected with the design, construction and utilization of self-propelled mechanisms, prime movers, components thereof, and related equipment to preserve and improve the quality of life." It shall accomplish this, the Constitution continues, by the "holding of meetings for the presenting and discussing of engineering papers, and the development of technical reports including engineering standards and recommended practices, and the publishing and distribution of such reports."

Annually the SAE holds its International Congress and Exposition at Cobo Hall in Detroit.

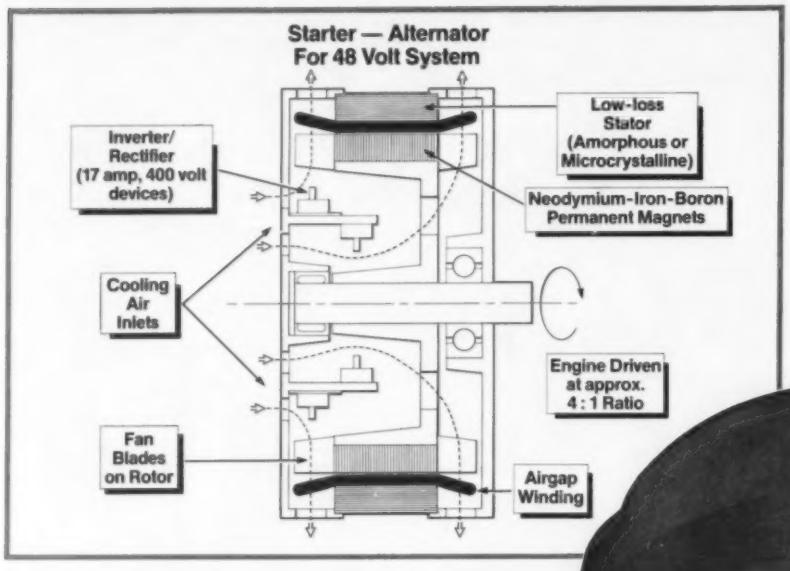
This exposition is the largest automotive engineering event held in the world. A true international event, this year's show featured exhibitors from all parts

continued

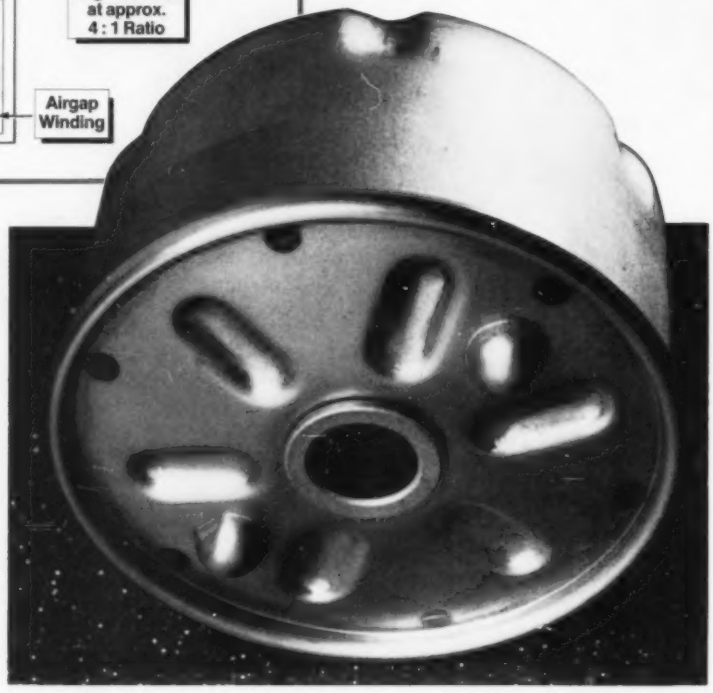
One of the larger displays at the SAE Exposition is always the American Iron and Steel Institute's vehicles in their body-in-white stage of production. This year's features were (from top to bottom): Cadillac Eldorado, Honda Accord and Jeep Comanche.



(right)
Lucas Industries's drive-by-wire throttle actuator involves an electronic control unit interproting a signal from the driver's gas pedal, and positioning the throttle by an electric motor driving the spindle, as well as controlling air:fuel ratio. The system provides a method for improving the driveability, economy and exhaust emissions of the vehicle. It also enables a number of additional features, such as idle speed and cruise control, to be achieved with a single actuator.



A 48-volt combined permanent magnet starter/alternator is the third stage of changes Lucas is forecasting in the next 10 years. The first stage is a dual voltage system with a 24-volt battery and alternator combined with a 12-volt converter.



This new, low-cost Glacier GF025 centrifugal bypass oil filter from AE Engine Components is designed for small, high-speed diesels.

of Europe, Japan, Korea, Australia, Brazil, and more. It also featured joint international exhibits from Australia, Korea and several other countries, booths from original equipment manufacturers (OEM) Mercedes Benz, Chrysler, Ford and divisions of General Motors Corp.

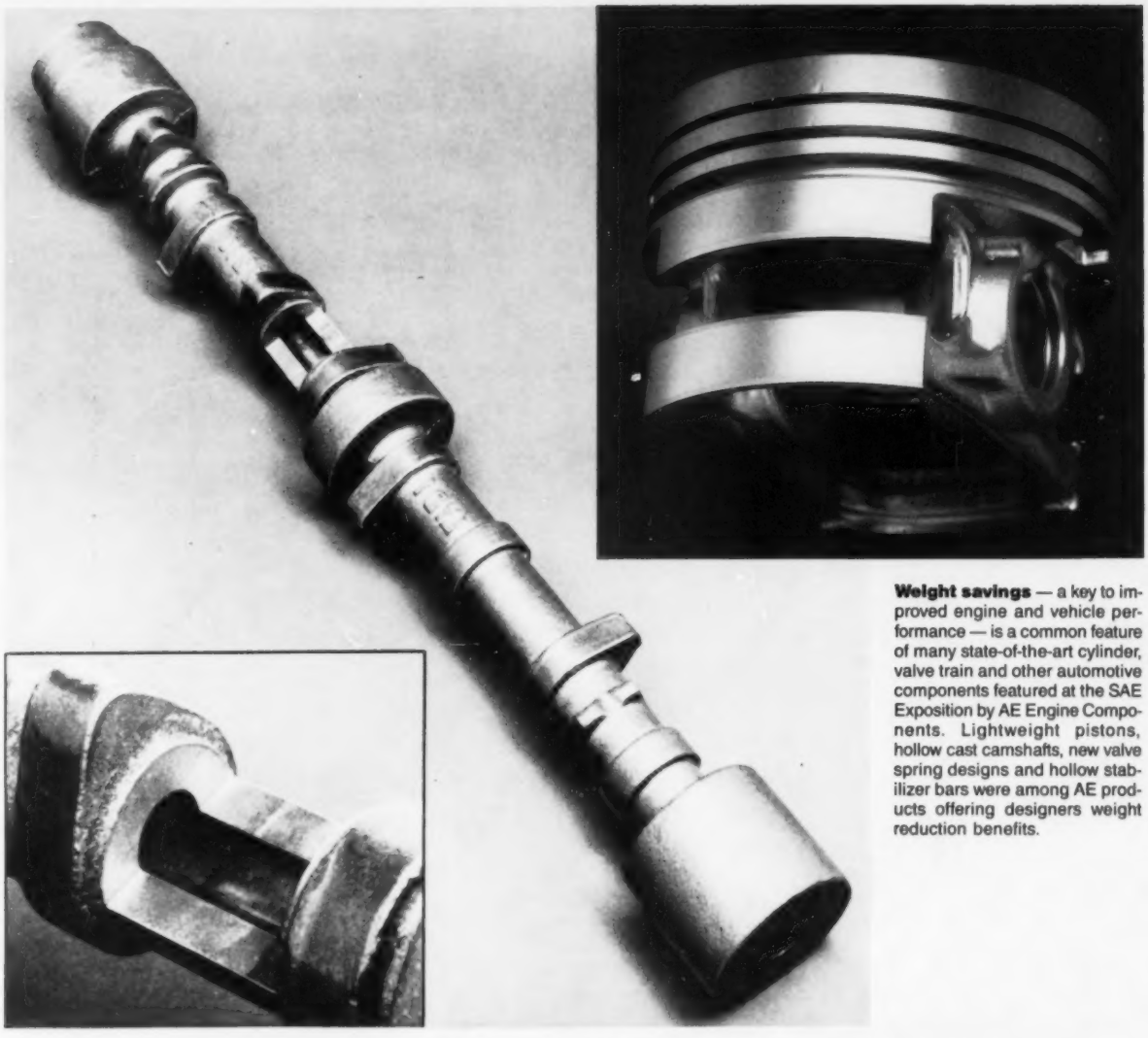
A total of 438 exhibitors displayed products ranging from tiny fasteners to entire car bodies. The range of technology on display was from simple materials, from which automobiles are built, all the way to complex computer-controlled structural testing systems, new engine designs, and much more. Total exhibit space for the event was more than 124,000 square feet of display booths with additional space used for special theme displays of new technology.

"Excellence in Engineering," was the theme for the 1986 SAE International Congress and Exposition.

"The challenge to today's automotive engineers is to design vehicles and support manufacturing systems that will insure superb products," said General Chairman for the event, Dale E. Dawkins, director, Truck Program Management, Chrysler Corp. "The sessions at this year's SAE Congress provided insight into many ways in which increased quality, technical advancement, and cost effectiveness can be engineered into cars and trucks, their components, and the manufacturing processes. What it comes down to is excellence — excellence in engineering. That is what we are all working toward."

The SAE International Exposition has experienced a remarkable rate of growth in the last few years, increasing in size by more than 50 percent just since 1984 and by more than 25 percent since last year.

"I think that the tremendous growth of this event is due to the changes taking place both in the manufacture and design of tomorrow's cars and trucks," said Dawkins. "Simultaneous engineering of both the vehicle and the process for manufacturing it, plus changes in the mate-



Weight savings — a key to improved engine and vehicle performance — is a common feature of many state-of-the-art cylinder, valve train and other automotive components featured at the SAE Exposition by AE Engine Components. Lightweight pistons, hollow cast camshafts, new valve spring designs and hollow stabilizer bars were among AE products offering designers weight reduction benefits.

rials and components used in tomorrow's cars, have brought about a change in the relationship between vehicle OEM's and suppliers. That's why the SAE Congress is so important. It provides a way for engineers to quickly learn about new developments and for suppliers from around the world to show off their capabilities," Dawkins concluded.

Record crowds of more than 31,000 attendees visited the SAE Exposition during the four days that it was open.

Today's engineers are creating "what amounts to a whole new auto industry structure," a top Rockwell International Corporation executive said in keynote remarks opening the Society of Automotive Engineers International Congress and Exposition. Martin D. Walker, executive vice president of the Pittsburgh-based multi-industry company, said that "Under the old system, the engineer was much like the assembly-line worker," with a narrow job and little involvement with others designing or building the same car.

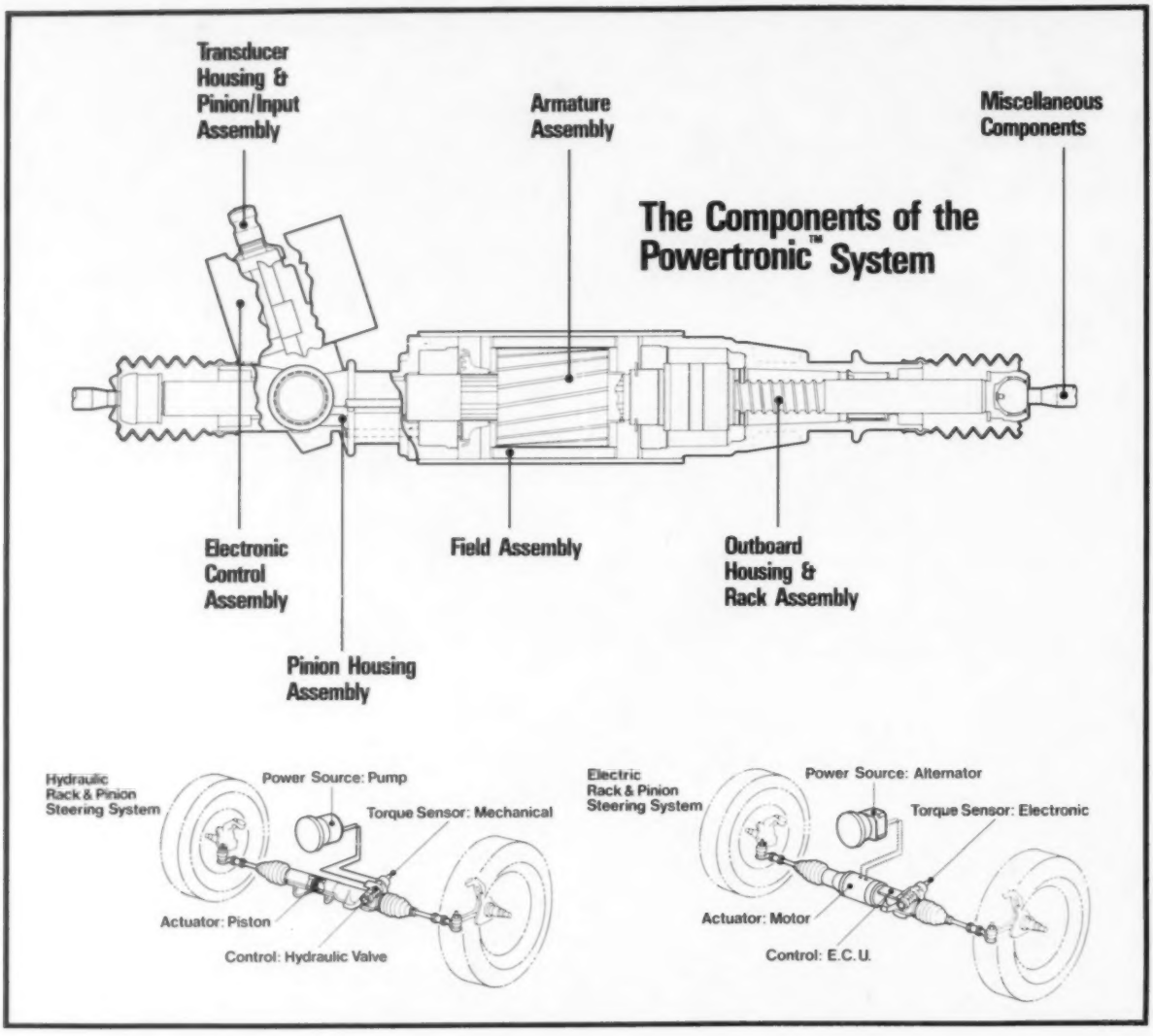
"He entered the picture, did his thing, and left," Walker noted.

Today, however, "the functions of research and market analysis, development engineering, styling and planning, process and product engineering, and all the rest, are involved together," Walker said.

"What it boils down to is a convergence of many disciplines, an up-front understanding of objectives by all concerned — an interaction of skills, with mutual accountability and trust between all team players," the Rockwell executive added.

Walker noted that his new type of partnership between the automotive manufacturers and their suppliers "will need early and total involvement of OEMs of responsible suppliers who have financial, technical and manufacturing strength; who are dedicated to the development and just-in-time supply of high-tech, zero-defect components at globally competi-

continued



tive prices; and who are willing and able to enter into an ongoing product planning involvement between supplier and OEM."

As the principal speaker at the 1986 SAE International Congress and Exposition Banquet, Elizabeth Hanford Dole, Secretary of the U.S. Department of Transportation (DOT), explained how engineers daily shape one of the legs of what she called the safety triad.

Mrs. Dole started by pointing out the importance of the automotive industry and change.

"Today," the Secretary said, "American highways play host to 130 million passenger cars — one third of all those on the face of the earth. The auto industry accounts, directly or indirectly, for one out of every nine jobs in this country. An entire generation — my generation — grew up with one eye cocked on the rear view mirror, and the other fixed on the drive-in movie screen, watching James Dean racing a stolen sedan in 'Rebel Without A Cause.'

"Well," she continued, "James Dean has been gone a long time now. And drive-ins are virtually museum pieces. Come to think of it, the new technology of auto design threatens someday to eliminate the rear view mirror as well. To some people, all this bespeaks too much change, too fast and too impersonal. To

(above)
TRW's Powertronic electronically controlled steering system replaces the hydraulic pump, hoses, and fluid of conventional power steering systems with electronic controls and an electric motor. The system monitors steering wheel movements via a sensor mounted on the input shaft of a rack and pinion steering gear. The electronic controller receives directional and load information from the sensor and activates an electric motor to provide power assisted steering. In addition to instantaneously responding to driver's actions, the TRW Powertronic continues to provide steering assist even when the engine stalls.

such persons . . . I put it a bit more directly when I say that when you're through changing, you're through.

"I have come to a city and industry where change is the stock in trade. But I come *from* a city where the status quo has been challenged as never before in my lifetime. And the results are bound to enhance the long range prospects of this industry.

"In fact," Mrs. Dole remarked, "we inhabit a world where national boundaries are no longer seen as natural barriers, to culture or commerce. And so we at DOT have embarked on a worldwide campaign called harmonization. We seek to harmonize our vehicle safety standards with those in other lands — not only to lower consumer costs but also to enhance our own ability to compete in foreign markets and to ensure that we devote every ounce of strength we have to remove all foreign trade barriers to our products.

"Even now, we are looking for areas where we can coordinate with European governments the adjustment of standards — everything from common symbols on vehicle control displays to similar rules for passenger car lights and brakes.

"That's just the beginning of changes I see on the American road," she observed. "Just a few short years ago, who would have predicted that more Americans would be driving more cars than ever before — even as highway fatalities per 100 million vehicle miles travelled would reach an all-time low? Yet that's exactly what happened in 1985.

"Who would have thought that the American public would ever accept mandatory safety belt laws?" Mrs. Dole asked. "The seed was planted in Tennessee, in 1978, with the first child seat belt law. And by last year, every state in the Union had passed similar legislation.

"Indeed, the biggest single challenge I faced when arriving at the Department three years ago was the 208 rule, (automatic occupant protection requirements) which became effective year before last. Since then, I believe it has contributed much to a nationwide awakening, which has found legislative expression in 19 states and the District of Columbia. As a result, lives are being saved for the first time in the 15 years that Americans have debated passive restraints.

"Who would have thought," she went on, "just a few short years ago, that one would open *Time* or *Newsweek* and find two-page advertising spreads touting auto safety initiatives? A poll taken last December found seven out of 10 Americans favored safety belt laws for driver and front seat passenger. And in states where mandatory laws have been enacted, an even higher percentage want them to remain on the books."

Then the Secretary of Transportation remarked, "I've spoken of changed expectations as well as changed designs. Before I leave the subject, may I point to the single most encouraging example of grassroot Americans leading their government toward safer highways and fairer laws? For while the engineers of Detroit may have been responsible for anti-lock brakes, improved steering columns and anti-lacerative windshields, it was drivers by the millions who changed the way we view the drunk driver in this country.

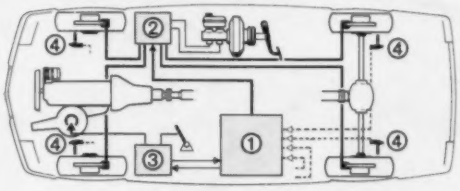
"A decade ago, we regarded him as a nuisance. Today, we see him as a po-

continued

Traction control (ASR) for passenger cars

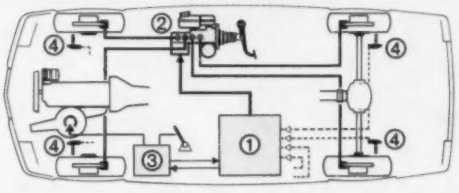
ABS/ASR with override of throttle-valve and brake action (ABS 2 basis)

① ABS + ASR electronics
② ABS + ASR hydraulics
③ Electronic accelerator pedal
④ Wheel-speed sensors



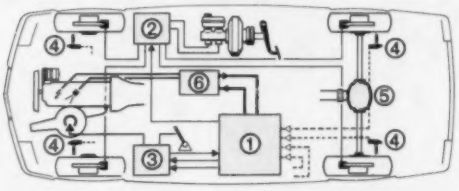
ABS/ASR with override of throttle-valve and brake action (ABS 3 basis)

① ABS + ASR electronics
② ABS + ASR hydraulics (integrated system)
③ Electronic accelerator pedal
④ Wheel-speed sensors



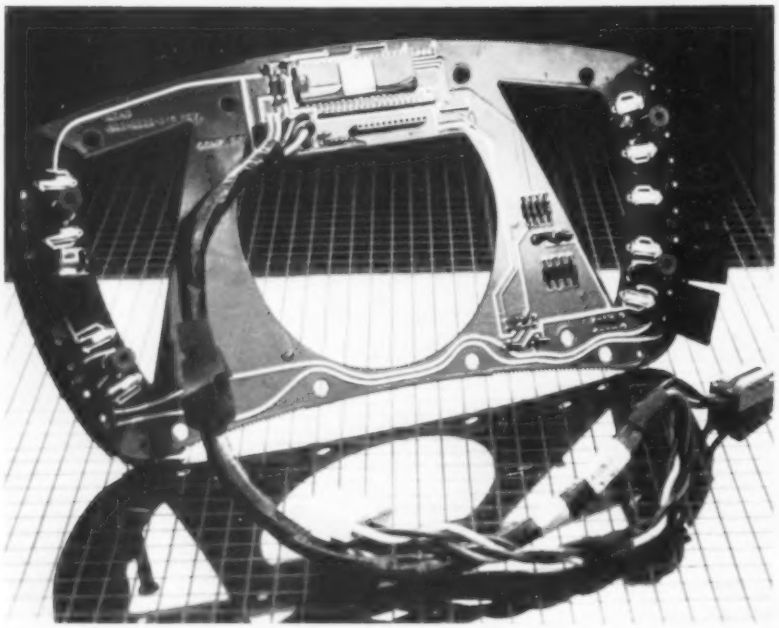
ABS/ASR with override of throttle-valve action and ignition

ABS + ASR electronics
① ABS + ASR electronics
② (ABS hydraulics)
③ Electronic accelerator pedal
④ Wheel-speed sensors
⑤ Differential lock
⑥ Motronic

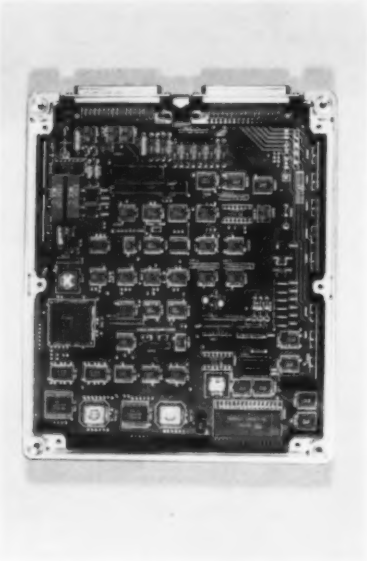


When roads are covered by snow, ice or gravel surfaces, or when there is the danger of aquaplaning, many drivers have considerable difficulty in transferring the power from their engine through the drive wheels and onto the road surface. If one of the drive wheels, or both, spins when moving, this can be extremely dangerous, particularly when accelerating. The result is that the vehicle breaks away due to the lack of lateral control. The solution to this problem is called traction control (ASR). ASR prevents drive-wheel spin by applying controlled reduction of the engine torque independent of the accelerator-pedal position. Bosch has combined its ASR with its anti-lock braking system (ABS).

(left)
Nissan's CUE-X combines the latest in "drive-by-wire" technologies with electronic control of the engine, transmission and suspension, as well as adjustable aerodynamic spoilers. CUE-X also has been fitted with a laser radar system. in the ASCD (automatic speed control device) mode it maintains a safe following distance, while the automatic collision avoidance functions in both the ASCD and simple display modes.



United Technologies Automotive has developed a custom multiplex solution for the traditional automotive wire harness system that allows reductions in wire count of up to 90 percent.



The number of electronically controlled systems in automobiles has significantly increased in the past years. Communication between control units allows further improvement in the overall performance of the car. Robert Bosch and Intel are jointly developing a high-speed communication link for interconnecting electronic control units within automobiles. This serial communication system now in development is called the Controller Area Network or CAN.

tential killer — and properly so. And DOT is working hand in hand with aroused groups of citizens and state legislators across the country to put attitudinal changes into the book of law.

"I will not be content until we get every last drunk driver off the roads and highways of this country, nor will I accept toothless laws and lenient judges. This is one change still unfolding."

To this end Mrs. Dole pointed out that, "Last year, the President signed a bill encouraging states to set 21 as their legal minimum drinking age. Thirty-eight states have now done so.

"Although we normally defer to states on traffic law issues, as the President said, a uniform drinking age will do away with 'blood borders,' where teenagers have a positive incentive to drink and drive, to cross state lines to take advantage of lower drink age laws and then make the return trip home 'under the influence.' New Jersey raised its drinking age in 1983 and the first year experienced a 26 percent reduction in nighttime fatalities among 19 and 20 year olds.

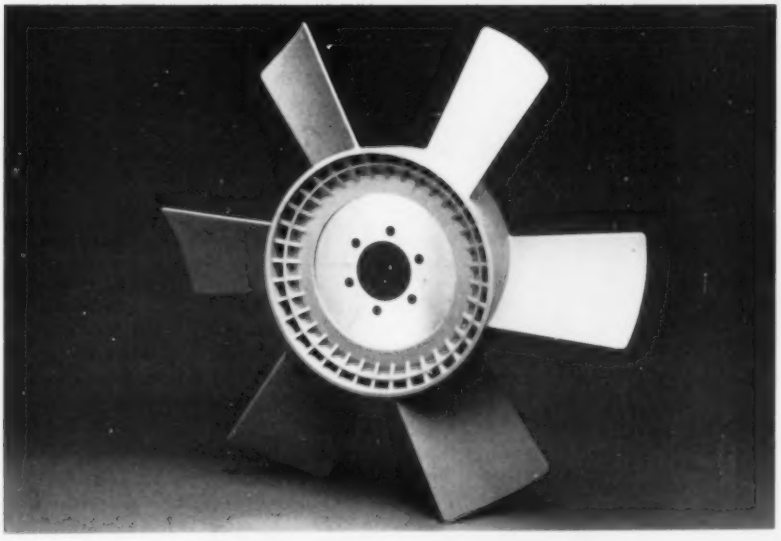
"I invite each one of you to contribute to the swelling chorus of outrage which says. 'Enough! No more death! No more injuries! No more waste and no more waiting!' "

She then explained that, "The human factor forms but the first leg of what I call the safety triad for our highways. The second rests on the condition of our highways and bridges. There's progress there as well.

"Our Interstate system — the safest, most efficient highway network in the world — is almost complete, and we're rehabilitating other roads and bridges at record rates. With that in mind, we have just transmitted to Congress one of the most dynamic highway and transit pro-

This Allied Automotive microprocessor controlled system is used for many applications in the acquisition and evaluation of data by means of specially developed software.

(above)
General Electric's Lamp Products Division is the first U.S. manufacturer of halogen lamps for such automotive applications as signal lamps, back-up lamps, cornering lamps, high-mount stop lamps and instrument-panel backlighting for both LCD and analog panel designs as well as halogen replacement bulbs for fog lamps. Halogen lamps are smaller, lighter and more efficient than conventional incandescent lamps, typically providing 30 percent more output per watt.



(left)
A tough, lightweight, water-cooling fan for trucks and off-road vehicles uses a CAPRON® Nylon 6 resin from Allied Engineered Plastics to reduce its moment of inertia and extend the life of fan belts, clutches and water pumps.

posals in U.S. history, which will give state and local governments greater flexibility to meet their own needs for safety and mobility.

Mrs. Dole went on, "And then there is the third and final leg in the safety triad — the one which all of you shape in your daily work. I speak, of course, of auto design. My department joins with the auto industry in looking for vehicle safety improvements that are practical and cost-effective.

"One new feature resulting from that search is the new center high-mounted stop lamp, now standard equipment on new cars. I approved that requirement in 1983, after years of research, field testing, and careful consideration of costs and benefits.

"We estimate that the new third light, once installed throughout the fleet, will prevent roughly 900,000 rear-end accidents a year, and save 40,000 injuries and nearly half a billion dollars in property damage. All for less than $10 per car, a reminder that safety doesn't have to be expensive.

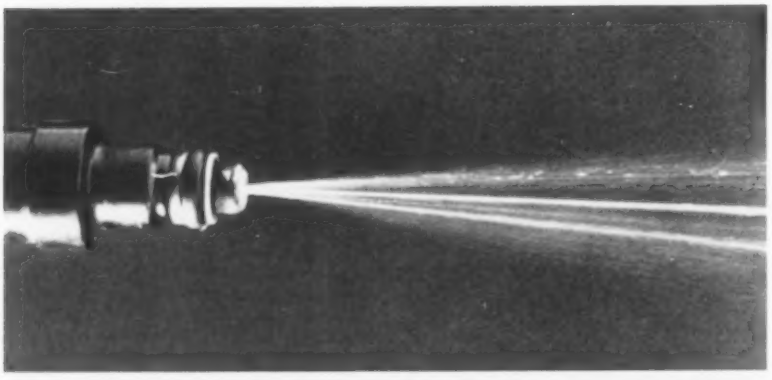
"Meanwhile," she continued, "research and development continues on a wide array of safety technologies. To date, at least six manufacturers have announced plans to provide airbags as standard or optional equipment on some or all of their lines in the years just ahead. While the air bag is undeniably useful, it is *most* useful in conjunction with safety belts.

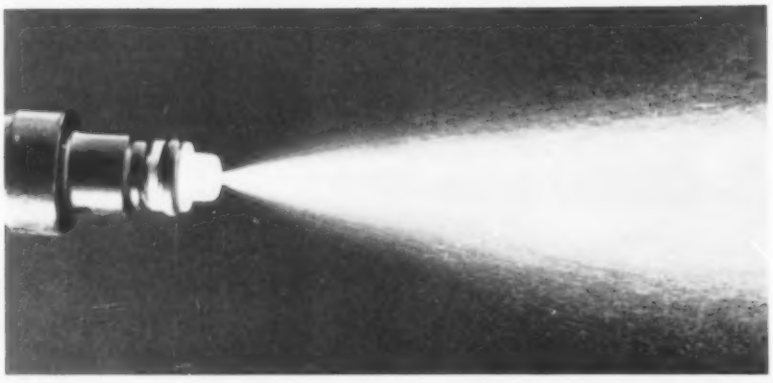
"But whatever the final range of restraint systems offered, it is safe to say that consumer demand will play a large part in determining what that future will hold."

Mrs. Dole explained, "If consumers want cellular-phone speakers and enter-

continued

Bendix DEKA multipoint injection fuel rails are custom designed for specific engine applications and include fuel pressure regulator and multipoint fuel injectors.





(bottom)
Gasoline spurts raggedly from a partly restricted injector, while a clean injector sprays in a power-boosting mist. According to A.M. Horowitz, acting manager, motor gasoline group, Mobil Research and Development, a powerful new detergent formulation can clean deposits from fouled port fuel injectors in as few as two tankfuls.

tainment systems that reproduce sound with concert hall quality — if windshield wipers will know when to wipe and drivers can command cruising speed at the sound of their voice — then it won't be because a Secretary of Transportation in Washington mandated these things. Any more than Congress can dictate which records are in the top 40, or the President can influence this week's bestseller list in the New York Times.

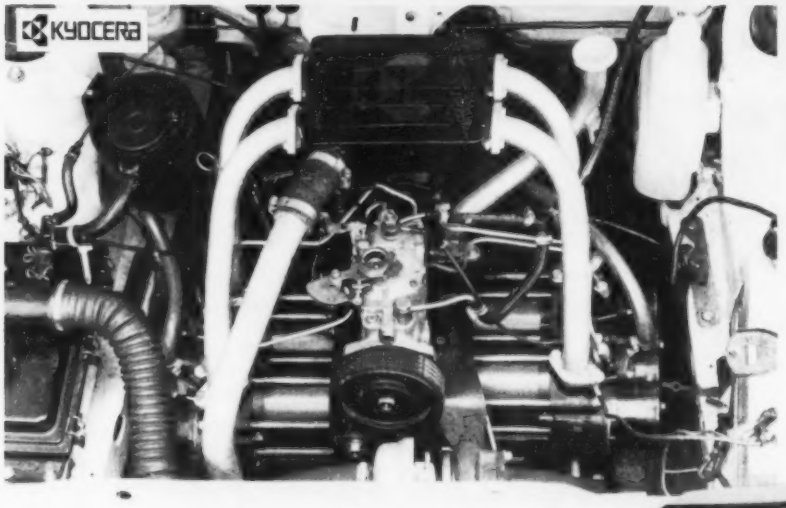
"On the other hand, a government that is sensitive to the creative dynamic — one that recognizes long-range planning needs and the fact that each model requires many years lead time — such a government can foster an atmosphere wherein individual genius can merge with corporate resources.

"A century ago, it was backyard inventors, solitary men like Selden, Goodyear or Edison, who changed the face of American industry. Today, it is teams of exceptional engineers who advance the frontiers of design and safety.

"What hasn't changed is the need for government to clear the deck of burdensome regulation and reflect in its own actions some of the same experimental energy which translates one man's dream from the drawing board to the auto showrooms.

"We will," she promised, "for example, continue to remove impediments to technological innovation. We intend our safety standards to encourage new safety technology and designs, not stifle them. And where the auto companies, SAE or any other group can suggest ways to streamline and update our standards, I am eager to listen.

"To cite just one example, we believe that our vehicle lighting standards can and should be simplified. If we could move toward more performance-oriented



(left)
One of the featured attractions of the SAE Exposition was this four-cylinder diesel engine made primarily from advanced ceramic components. Most of the critical wear parts inside the engine are made from silicon nitride including the pistons, cylinder, head plate, valves, valve guides, tappets, piston pins, piston rings, exhaust manifold and turbocharger rotor.

Switching from welding bare metal to bonding coil-coating steel with Betamate structural adhesives from Essex Specialty Products resulted in a two-seat, three-wheel vehicle that is "not only lightweight and corrosion-resistant but also stronger quieter and less costly to make than its welded counterparts," says Frank Boulton, president of Moto America. The Gashopper weighs 250 pounds and can deliver over 100 miles per gallon with a top speed of 30 mph with a two-horsepower gasoline engine.

standard for headlamps, it would reduce excessive design restrictions on auto manufacturers without compromising essential safety. It would give you more flexibility in front-end design for better aerodynamics and fuel economy. And it would eliminate the need for such time-consuming regulatory approvals of new headlamp designs.

"Your product," Mrs. Dole observed, "a product shared with dozens of foreign countries, many represented at this gathering — is vital in most American lives. It determines how we move about, how we see the world around us, how we see ourselves.

"If anyone doubted the pervasive role of the automobile in modern life, he need only have joined the throng of moviegoers who last summer flocked to theaters to see the biggest hit of the year — a film wherein a teenager rode a car so advanced it can travel through time 'Back to the Future.'

"It was only fitting. For however we get to the future, we'll get there on four wheels. And however the vehicles of the future look, they will doubtless be the product of your imagination.

"Along the road, there will be plenty of fresh changes. For every custom was once an eccentricity; every idea was once a dream. Including democracy — and democracy's favorite transport — the automobile.

"We've traveled a long way together," she concluded. "The road ahead looks more promising yet."

Of course we can't include pictures of all that was promising at this year's SAE show, but you will find a representative variety on these pages. In addition, we will be relaying information that we found interesting at some of the technical sessions throughout the next year.

THE FIRST 1986 TEST CRASH RESULTS

VEHICLE	SPEED/WEIGHT	HIC Driver/Pass	CHEST G'S Driver/Pass	FEMUR LOADS Driver left/right	FEMUR LOADS Passenger left/right
BUICK CENTURY 2-Dr Coupe (FWD)	35.1 / 3360	647 / 928	37 / 49	945 / 740	670 / 720
BUICK CENTURY 4-Dr Sedan (FWD)	35.2 / 3250	699 / 672	40 / 37	740 / 240	690 / 490
MAZDA 323 LX 2-Dr Hatchback (FWD)	35.2 / 2510	802 / 894	66 / 47	425 / 440	200 / 325
YUGO GV 2-Dr Hatchback (FWD)	35.1 / 2320	1415 / 1318	59 / 38	870 / 086	695 / 525
BUICK LE SABRE 2-Dr Coupe (FWD)	35.5 / 3650	908 / 752	39 / 40	879 / 1181	583 / 368
ISUZU I-MARK 4-Dr Sedan (FWD)	34.9 / 2380	2172 / 1146	43 / 43	486 / 176	275 / 260
OLDSMOBILE DELTA 88 4-Dr Sedan (FWD)	35.4 / 3710	688 / 681	50 / 33	476 / 978	731 / 364
PLYMOUTH COLT VISTA 4-Dr Wagon (FWD)	34.7 / 2980	810 / 1356	45 / 36	5048 / 1297	858 / 517

FWD = Front Wheel Drive

The National Highway Traffic Safety Administration (NHTSA) recently released the results of eight motor vehicle crash tests. These are the first results for 1986 from NHTSA's experimental New Car Assessment Programs (NCAP).

All the vehicles were crashed in frontal tests at 35 miles per hour into a fixed barrier. This is five mph faster than the speed prescribed for compliance with several existing federal motor vehicle safety standards (FMVSS), including the automatic occupant protection requirements of standard No. 208, which will be phased in after Sept. 1. The crash tests are designed to indicate, for vehicles within the same size and weight class, relative levels of occupant protection and vehicle safety performance.

NHTSA said that the test results are intended to indicate relative crash protection provided to occupants wearing safety belts. The results of these 35 mph tests are not applicable to unbelted occupants. It also is important to emphasize that in the government's crash test program only one car of any given make or model is crashed in a specific test.

Subsequent crash test results of any vehicle could vary because of differences in the way cars are manufactured and equipped or due to slight variations in test conditions. Therefore, small differences in the results among vehicles should not be viewed as significant.

Instrumented dummies, protected by the vehicles' standard safety belt system are used in all tests. The head, chest and upper legs of the dummies are equipped with instruments which monitor impact forces and accelerations. The head acceleration is used to calculate the head injury criterion (HIC), a measure of the potential for head injury. The actual chest acceleration (in G's) is used as a measure of the potential for chest injury.

In general, the lower the HIC, chest G's and femur load, the less likely the drivers and front-seat passengers would be seriously injured or killed in a frontal crash at 35 mph. A HIC value of 1,000, a chest deceleration of 60 G's (G is a unit of acceleration) and a femur load of 2,250 pounds, are the maximum values permitted in FMVSS No. 208. It must be noted that a 35 mph crash is one-third more severe than the 30 mph crash used in compliance testing; thus, higher values are expected under NCAP testing.

The experimental New Car Assessment Program began in 1979. The agency is continuing to examine several aspects of the program, particularly the relationship of these tests to real-world accidents and injuries, in order to improve crashworthiness information provided to consumers.

STATE OFF-HIGHWAY MOTORCYCLE REQUIREMENTS

JUNE 1985

MOTORCYCLE INDUSTRY COUNCIL, INC.

This information is provided by the Motorcycle Industry Council Government Relations Office. As State Legislatures continue to enact and/or amend off-highway vehicle programs and requirements, new charts with updated information will be issued. Contact the Motorcycle Industry Council offices listed below for further information concerning off-highway vehicle legislation or for additional copies of this chart.

STATE	OFF-HIGHWAY REGISTRATION	VEHICLE TITLE	OPERATOR LICENSE	MINIMUM AGE TO OPERATE	OFF-HIGHWAY EQUIPMENT REQUIREMENTS: LIGHTING	BRAKES	MUFFLER	SPARK ARRESTOR	OTHER	RIDER EDUCATION	STATE OHV FUNDING	OHV ADVISORY COUNCIL	STATE OHV AREAS	TOTAL MOTORCYCLES USED OFF-HIGHWAY AT SOME TIME
Alabama		7											Yes	85,100
Alaska		7					●-D						Yes	33,600
Arizona		●					●-C						Yes	73,400
Arkansas		7										Yes		85,400
California	●-1A	●			●-17	●	●-19C	●-20		30	●-26	Yes	Yes	457,100
Colorado		8					●-19-C						Yes	63,700
Connecticut	●-3	7			●	●	●						Yes	29,100
Delaware	●-4A	8		●-11	●-17	●	●-19C	●	●-21	30	●-25			6,600
Dist. of Col.		●												300
Florida	●-5BE	●					●-D		●-21D				Yes	138,200
Georgia		8				●	●							94,800
Hawaii													Yes	—
Idaho	●-5A	8					●-19			30	●-26	Yes	Yes	44,500
Illinois		7												116,200
Indiana	●-4BE	●-9		●-12	●	●-18	●				●-25			86,100
Iowa		8					●-D						Yes	66,200
Kansas		7												44,500
Kentucky		7												49,700
Louisiana		●												119,900
Maine		●-10							●-23					27,000
Maryland	●-5BD	7	●-2D	●-15	●-17D	●-D	●-19D				●-25		Yes	36,100
Massachusetts	●-5B	7		●-12	●	●	●-19	●	●-21				Yes	41,300
Michigan	●-4A	8		●-13	●-17	●-18	●-19C	●		30	●-25	Yes	Yes	148,400
Minnesota		●-9											Yes	100,900
Mississippi		●-9											Yes	65,000
Missouri		●					●-D	●-D					Yes	79,400
Montana		8												34,600
Nebraska		8											Yes	40,000
Nevada		●-9						●-E						30,900
New Hampshire	●-4B	8		●-11	●	●-18	●-19	●		30,31	●-27	Yes		22,000
New Jersey		8												56,400
New Mexico	●-5A	●											Yes	31,400
New York	7	8												139,500
No. Carolina		8										Yes	Yes	76,100
No. Dakota		8					●-19D						Yes	24,900
Ohio	●-5A	8	●-E	●-14	●-17	●	●				●-25		Yes	132,500
Oklahoma		8			●-D		●-D	●-D	●-21D			Yes	Yes	85,300
Oregon		7			●-17	●	●-19	●					Yes	72,800
Pennsylvania		8					●-D	●-20D					Yes	144,500
Rhode Island	●-5B	●		●-15	●-17	●	●-19		●-23				Yes	8,100
So. Carolina		●-9			●-D	●-D	●-D	●-D					Yes	36,000
So. Dakota		●-9					●							22,200
Tennessee		●					●-D	●-D					Yes	101,800
Texas		●					●-D	●-20D	●-21D				Yes	398,800
Utah	●-4B	8		●-16	●-17	●	●-19C		●-24	30	●-25	Yes	Yes	72,500
Vermont		8												11,300
Virginia		8					●							64,300
Washington	●-4A	8			●-17	●	●-19	●		30	●-26	Yes	Yes	105,600
W. Virginia		7												43,200
Wisconsin		8									●-28	Yes	Yes	91,000
Wyoming		8												20,200
U.S. Total														3,815,000

● Requirement in Law

1. Except street-registered OHMs. Identification sticker required to transport competition OHM
2. Unless supervised.
3. Not implemented for OHMs
4. Except street-registered OHMs or OHMs in races.
5. Except street-registered OHMs.
6. Except OHMs in races.
7. At owner's option.
8. Not issued for OHMs.
9. Required only if fee exists.
10. Not issued for OHMs under 300 cc. Optional for others.
11. 12 unless supervised.
12. 14 unless supervised.
13. 16 unless supervised or 12 with OHV safety certificate.
14. 16 unless supervised. Minimum 12 in state OHV areas.
15. Minimum 12/16 unless supervised in state OHV areas.
16. 16 unless supervised.
17. Night operation only.
18. Specific performance requirements.
19. Decibel sound limit specified.
20. Approved by U. S. Forest Service.
21. Approved helmet.
22. Approved helmet if under 16.
23. 16 sq. in. reflective material each side of OP. Approved helmet in OHV areas.
24. Approved helmet in competitive events.
25. Registration and other fees.
26. Fees and gasoline tax allocation
27. Registration and other fees. Gas tax refund off-highway users.
28. Special appropriations.
29. Approved helmet if under 15.
30. Safety education & info program available
31. Required for ages 12-16 to cross highway
A. By Motor Vehicle Registration Agency
B. By Recreation Management Agency
C. Except in authorized competitive events.
D. Administrative regulation. Applies only in state OHV areas.
E. Applies only in state OHV areas.

OHM SOUND LEVEL LIMITS

		TEST PROCEDURE
CA	Manufactured before 1973 90 dBA, 73-74 86 dBA, 75 and after 86 dBA	a
CO	Manufactured 1971-72 94 dBA, 73 and after 94 dBA, different local limits also permitted.	a
DE	Manufactured 1975 and after 86 dBA or EPA limit.	b
ID	92 dBA.	c
MD	Manufactured after 1973 86 dBA, 73 and after 94 dBA	a
MA	103 dBA.	b
MI	Manufactured before 1973 90 dBA, 73-74 86 dBA, 75 and after 86 dBA or EPA limits.	a
NH	Manufactured 1973-74 88 dBA, 75 and after 86 dBA.	a
ND	86 dBA.	a
OR	In use. Model year 1975 and before 102 dBA, 76 and after 99 dBA. Certification 1977-82 models 81 dBA, 83-87 78 dBA, 87 and after 75 dBA. Racing 105 dBA.	d,e,f
RI	Manufactured after 5/72 82 dBA, after 5/74 73 dBA.	e
UT	92 dBA	b
WA	86 dBA or 105 dBA	a,d

TEST PROCEDURE

a. Acceleration test 50 feet incorporating SAE J331a or similar test method.
b. Passby test 50 feet.
c. Passby test 20 feet.
d. Stationary test 20 inches.
e. Measured at 50 feet. Test procedure not prescribed.

Although this chart represents information from the most authoritative sources available as of the date shown above, the Motorcycle Industry Council is not responsible for accuracy or completeness.

MOTORCYCLE INDUSTRY COUNCIL, INC.
3151 Airway Avenue, Building P-1 ● Costa Mesa, CA 92626
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1235 Jefferson Davis Highway, Suite 1410 ● Arlington, VA 22202
(703) 521-0444

TRUE ACCIDENTS

Following are a few reports of accidents involving Air Force members. We have removed names and references to dates and places.

SNOW-COVERED

A master sergeant was driving north on a highway at about 7:45 in the morning. Visibility was very poor, with blowing snow. Another driver was traveling south, following a truck. A northbound semi truck went by, throwing up even more snow. After the semi passed, the driver thought he was in his own lane, but he saw headlights in front of him and he swerved to the right. His car collided with the master sergeant's head-on. Neither man was wearing a seat belt and both received head injuries. The master sergeant was killed. The investigation revealed that the other driver had been on the wrong side of the highway.

MIDDLE OF THE STREET

About 7 p.m. an airman was drinking with some friends in his dormitory. At 9:30, they left to attend a going away party for a friend that was being held at a private home near the base. By the time they arrived at 10:30, the airman had already had at least three mixed drinks. Several times during the party he was offered a ride back to the base, but each time he refused. At about 11:45 he got into a fight with another guest, and he left shortly afterward by climbing the backyard fence. One of his friends drove around looking for him but didn't find him. About 12:15 a.m., a southbound motorist saw him. He was walking north in the middle of the street, going toward the base nine miles away. Just after this, a northbound car struck him. He was thrown 60 feet, causing fatal injuries. He was dead at the scene. His Blood Alcohol Level (BAL) was .3.

TRAIN CROSSING

About 6 p.m., two airmen left the house they rented to drive to visit their landlord, who lived six miles away. Shortly after, they came to a railroad crossing. The red lights were flashing for an approaching train, and the driver asked where the train was. The passenger said, "It's a ways back; go ahead." The driver proceeded across the tracks without looking, relying on the passenger's word. The train, approaching from the left, hit the car at the left rear quarter panel and dragged it down the tracks about 15 feet before the car slid off. The car then hit some concrete-reinforced fence posts. The posts ripped through the passenger side of the car, splitting it in half. The passenger was fatally injured. Investigators thought the passenger might have mistaken some lights by the railway for those of the train, and decided the train was farther away than it actually was.

LIGHT POLE

About 9:30 one evening, a foreign national visited a staff sergeant at his home near his overseas base. The two decided to go out to eat at a restaurant, where they had wine and drinks with dinner. They returned to the staff sergeant's house about 11:30, had a few more drinks, and the the staff sergeant drove his friend home, about three kilometers away. On his way back to his house about 12:30 a.m., the staff sergeant lost control of his car and it skidded into a light pole, impacting at the right rear passenger door. The car revolved around the pole, and the staff sergeant was ejected through the windshield. He struck the light pole with his head and then collided with a parked car about eight feet away. He died of massive head injuries. Investigators determined he had been speeding. He had not worn his seat belt.

SKID

On leave on a long weekend an airman visited his father, who lived about 300 miles from base, taking another airman along. One day they went on a four-wheeling trip to the mountains with two civilians. One of the civilians was driving (the airman later said he was driving "fairly fast"). As they approached a 45-degree curve, the driver braked and the vehicle skidded. The driver overcorrected and it skidded in the opposite direction, turning 180 degrees and leaving the roadway. It went down an eight-foot embankment and rolled onto its top. As it started to roll, the second airman was partially ejected and the vehicle rolled over him. His head was crushed and he died at the scene.

INEXPERIENCE

A staff sergeant and his father drove over 750 miles in the father's pickup to purchase a motorcycle. The next day they started back home. The staff sergeant was riding the motorcyle, with his father following in the pickup. He intended to ride 200 miles and then transport the cycle in the pickup the rest of the way. They were driving north on a two-lane asphalt highway at about 70 mph. By 2:40 p.m. they had gone about 150 miles of the 200. At a slight right curve in the road, the cycle rider went across the double yellow lines into the southbound lane. He collided with a small truck and was thrown over the cab, hitting a camper shell. He landed on the pavement. During the collision with the truck he suffered massive head injuries, and he died at the scene. Investigators determined he had never before driven a motorcycle this powerful and this plus the high speed had caused him to drift across the highway.

NO HEADLIGHT

An airman first class worked all afternoon on his motorcycle with a friend. They ate and the friend left about 5 p.m. Then the airman and his girlfriend went to a store, stopping on the way back to buy some alcohol. They each had three mixed drinks before visiting her mother. They returned and about midnight she decided to go home. He suggested that he drive, but she refused. Then he said he would follow on his motorcycle, but she did not want this because his cycle's headlight was not working. He went to his apartment, but when she drove away he came out with his helmet and followed her. At an intersection, a driver let her go by and then, not seeing the approaching motorcycle, pulled out onto the street. His pickup was hit by the cycle and he saw the airman and the cycle slide by and collide with a parked motor home. The airman was declared dead two days later in the hospital.

Timely Topics

TIRE INFO FROM NHTSA

A consumer pamphlet explaining the Uniform Tire Quality Grading System and a listing of current tire grades are available from the National Highway Traffic Safety Administration (NHTSA).

Under the grading system, each manufacturer of passenger car tires grades its products in three areas: treadwear, traction and temperature resistance. Consumers can find the grades molded into the sidewall of the tire, as well as on a paper label attached to the tread.

The treadwear grade is a comparative numerical rating based on the wear rate of the tire when tested under carefully controlled conditions. For example, a tire graded 200 is estimated to have its useful tread lasting twice as long (in miles traveled) as a tire graded 100. However, the actual tread life and wear rate of tires will also depend considerably on conditions of their use. Traction grades represent a tire's ability to stop on wet pavement as measured under controlled conditions. The traction grades are A, B, and C. Tires graded A may give better traction performance than those graded B or C based on straight-ahead braking tests. The grades do not reflect the cornering or turning traction performance of the tires.

Temperature grades represent a tire's resistance to heat and its ability to dissipate heat when tested under controlled conditions. While grades A and B represent higher levels of performance, grade C still meets the minimum performance level required by NHTSA standards.

For a free copy of the pamphlet and current list of tire grades, write:

General Services Division, Rm 6117
NHTSA
400 Seventh St., SW
Washington, D.C. 20590

AIR BAGS ON PORSCHES

Porsche Cars of North America, Inc., will meet 1987 passive restraint requirements by offering air bags in certain models.

Drive-side-only air bags probably will be standard on at least one of Porsche's 4-cylinder cars and optional on the remaining three. Porsche's 4-cylinder cars will be the 924-S, the base 944, and the 16-valve 944 and the 944 Turbo during the next model year. Bags will not be offered on the Porsche 911 line or the 928-S.

In total, air bags will be installed in at least 10 percent of the Porsches to be sold in the U.S. during 1987.

THIRD BRAKE LIGHT AVOID COLLISIONS

Have you noticed the high-mounted brake lights on new cars and wondered why automakers put them on their new 1986 model cars? The lights are designed to reduce the number of rear-end collisions, says the Automotive Information Council (AIC). Twenty-five percent of all auto accidents in 1984 involved rear-end collisions.

The Federal government mandated in 1985 that all automobiles manufactured after 1985 be equipped with a small stoplight mounted near the car's rear window at eye level. The new stop light could eliminate up to 40,000 injuries and could save $434 million in property damages each year. Prior to mandating the new brake light, the government studied several large automotive fleets equipped with the new third brake light. The results revealed that cars with the new rear stop light were involved in fifty percent fewer rear-end collisions than the fleets without them.

The studies showed that drivers more readily observe the rear stop lights because they are closer to eye level than brake lights near the bumper. A driver can also see the lights a few cars ahead through other vehicles' windows.

Still, many motorists do not have a true perception of the distance needed to stop an automobile when traveling at highway speeds and in poor weather conditions.

To maintain a proper stopping distance between your car and the one in front of you, follow the two second rule, says AIC. Watch the car ahead and when it passes a fixed object, like a sign or an electrical pole, start counting "one-thousand-one, one-thousand-two . . ." If your car reaches the fixed object before you could count to "one-thousand-two," you are following the car ahead too closely.

Under severe weather conditions, such as heavy rains or snowstorms, AIC recommends doubling stopping distances and even tripling the stopping distance when roads are icy.

CAR COLORS

Have you had your eye on a particular car lately? It's all shiny, brand new and begging to go home with you. Have you ever thought about what colors this same car might have been offered in a couple of years ago, or will be a couple of years from now?

The automakers put a lot of time and effort into their annual choices for car colors. Since a car's color affects its salability, the auto companies want to predict future favorites. They consult color trend forecasters in the clothing, home furnishings and building products industries. Simply, consumer auto color preferences change from year to year, and the auto makers want to be on top of new color trends.

They've found that fads and fashion can affect the popularity of car colors. So, while today's dream car may be a simple shade of Chianti Red, tomorrow's may very well be something in Rose-Coral. For example, according to Old Cars Weekly, wild paint colors were predominate in 1970, refelecting the popularity of bright, psychedelic colors in clothing. Chevrolet made cars in Hugger Orange. Dodge had Sublime and Panther Pink cars. American Motors offered Big Bad Orange. Ford got really creative with Bring 'Em Back Olive, Freudian Gilt, Hulla Blue and Anti-Establish Mint.

The Auto companies have found that consumer color preferences can even vary according to the size and type of vehicle. According to the DuPont Corp., the five favorite colors for full and intermediate-sized cars in 1984 were light red-brown, white, dark blue, light blue and silver. The top five color choices for compact cars included red instead of silver. As for light trucks, the five favorite colors included light grey and red instead of silver and light red-brown.

The color of the car can influence its sales potential, not only for new cars but for used cars as well. A study of used-car color preference by the consulting firm of Runzheimer and Company, Inc. found the right color can make as much as a $300 difference in the selling price of a car. They found bright red and beige to be the colors most preferred by the used car buyer. (Automotive Information Council)

Backfire LETTERS TO THE EDITORS

NAVY BELTS

This letter is in response to a letter appearing in your "BACKFIRE" section of the January 1986 edition of DRIVER entitled "Must Have Seat Belt Law" by QM1/SS Corrao, FPO Miami FL 34092-2366.

The Navy, as of 12 December 1985, requires (OPNAVINST 5100.12C) that all Navy military personnel, on or off duty, on or off base, riding in government or private motor vehicles wear safety belts at *all* times, regardless of state law. A provision in the Navy directive states that violations of the safety belt use requirement is punishable under the Uniform Code of Military Justice. When Navy personnel are injured as a proximate result of their non-use of safety belts, such violations may be considered in determining compensation to which an individual may be entitled as a result of the injuries incurred.

The Navy has lost too many *valuable* unbuckled personnel as a result of injuries received in motor vehicle mishaps. The firm stand by the Navy will undoubtedly save many lives.

Capt Robert H. Fred, USN
Norfolk, VA 23511-5796

UNRUFFLED

The winters in western Pennsylvania, the rugged, hilly terrain, and the old fashioned roadway system create driving conditions which are possibly as hazardous as anywhere in our nation.

Recently a member of our unit approached me and told me he felt obligated to tell about his recent automobile accident. Because the young man appeared to be in excellent physical condition and bore no signs of traumatic injury, I assumed he was about to tell me about a minor close-call-type of mishap. I was not expecting to hear the seat belt success story that he felt obligated to tell me. He said he had gone flying in his car.

He was driving to his home late at night after a late work shift, and he was driving cautiously on a treacherous, iced-over road that wrapped around a steep hillside. Heavy snowfall was sharply reducing the visibility and further reducing the traction on the road surface. His car was a late model front wheel drive with studded snow tires. Even though he was driving cautiously and his car was properly equipped, he entered into a skid that took him toward the shoulder of the road. He said he lost all sensation of control over his vehicle, and turning the steering wheel had no effect on his vehicle's movement. He felt as if his vehicle was suspended in air.

He departed the road surface at the top of a 150' high embankment, and his vehicle flipped onto its roof when it struck a partially knocked over guard post. The ensuing inverted slide and flight destroyed his vehicle, impact by impact. As the vehicle bounced repeatedly on its roof, the roofline collapsed to the seat backs, and he was compressed to a prone position over the front seat. Sensing that the vehicle was accelerating, he hoped it would strike an obstacle such as a tree before reaching a fatal velocity. But there was no tree, and he entered flight in a near-vertical dive which ended when his vehicle impacted the ground on its grill and fell back onto the roof.

He released his seat belt/shoulder strap, which had locked, and fell slightly to the roof. After kicking out some broken glass in a side window, he was able to squeeze through to the outside and stand up beside the vehicle. He was uninjured, unscratched and unbruised. His three-piece suit was not ruffled.

Local residents who heard the crashing sounds ran from their houses and asked him if he had seen the accident and if he had tried to free anybody from from the wreckage. He responded by saying that he had seen the accident, and that nobody remained in the wreckage. When the onlookers realized that he had been the driver, some of them checked the license place for a number to play in the state lottery. The late model vehicle was little more than a metal pancake. The steering wheel was crushed, and the back of the driver's seat had been impaled by an unidentified object.

Maj Boehmer J. Gorr, PaANG
Pittsburgh, PA 15231-0459

DRESS FOR THE FALL

First I would like to congratulate you on your super publication. The material is always of top-quality and very informative. As the Squadron Industrial Safety Officer for my unit here in the Philippines, I frequently use articles from your magazine as safety crosstell, posting them on the bulletin boards in the squadron areas. Keep up the good work!

Recently, there have been many articles, both pro and con, about motorcycles surfacing. As a motorcyclist and an MSF Instructor at Clark Air Base, these articles catch my eye and they're usually the first thing I read. Here is another view of the subject.

I'm 32 years old with 14 years in the USAF. I have been biking for about 20 years and have enjoyed every minute of it. Recently, I had the misfortune of having my first mishap on two wheels.

On 22 March, I left Clark AB, with my wife as a passenger, on a leisure trip to Baguio. About eight miles from the base, I picked up a nail with my rear tire, causing a blowout at 50 mph. At first, I thought I had hit an oil slick as there was no noise and the bike started sliding left.

Following my own experience from teaching, I steered in the direction of the skid. At that point, the bike shifted to the right, starting a "dancing" effect (back and forth). I started slowing the bike and looking for a place to get off the road. I was finally able to get to the shoulder (gravel) and just about had it stopped when the bike violently "highsided," tossing my wife and I off. As we rolled off the bike, I did a "tuck and roll" while my wife stayed on the ground. After popping up out of the tuck and roll, ending up on my feet, I quickly assessed the situation. My wife was not injured (though she was scared) and the bike was still running. I hit the engine cut-off and went to check on my wife, attempting to calm her down.

After loading up the bike and taking it back to base in a pickup, I had plenty of time to think about the events and the results. We (MSF Instructors) preach the adage "Dress for the Fall — Not for the Ride." Both my wife and I had the full complement of riding gear on that day (gloves, long sleeve jacket, helmet, eye protection, etc.) and I am certainly thankful. In addition, had I not had previous

Backfire

LETTERS TO THE EDITORS

"dirt" experience combined with my instructor skills, I truly feel like we could (and would) have gone down on the first slide and probably sustained more serious injuries. As it was, I received only a small scratch on my right elbow and my wife was just shook up.

All I can say is — it happened to me and I'm glad I was prepared. I hope other riders will read this and use it in their own riding experiences. Full riding gear is the smart (and only) way to go. The folks at the hospital get enough practice with other mishaps and don't need to brush up on their skills by treating someone who could have avoided that trip to E.R. by being prepared.

Again, keep up the super work on the magazine and keep those letters coming.

TSgt Rick Gross, USAF
APO San Francisco 96410

"TORQUED" OFF

Your article on "Good Brakes" (Feb 86) was well written but has some misleading information in it. On page 26 you state "The wheel bearings should be torqued to manufacturers specifications." This is very misleading. The torque you reference is designed to "seat" the bearings and remove any grease or burrs which could cause any excessive play in the wheel later on. After you torque the nut, it is loosened and then hand tightened. Then you back it off (no more than ½ a flat) until you can line up a hole in the spindle. Hopefully no one who read the article has "torqued" their wheel bearings and left them that way because it will over heat the bearings and could cause them to seize on the spindle and result in loss of control of the vehicle. Your magazine is always well worth reading, so let's keep it that way.

TSgt Carl Stover, USAF
Langley AFB, VA 23665-5001

The complete specifications usually include how far to back the nut off after seating the bearing to the proper torque.

LAW OF THE LAND

Occasionally see a copy of DRIVER Magazine. Think a great effort is made to reduce accidents by all members of the Armed Forces.

Some years ago much stress was placed on driving defensively and all personnel had to take the Defensive Driving Course.

Now the emphasis seems to be on mandatory wearing of passive restraints and to hell with driving defensively — your passive restraints will protect you. It occurs to me that if a bit more emphasis were to be placed on driving defensively and the life you save just might be your own . . . improved safe vehicle operation might result.

I continually am amazed at the number of drivers who pass me in the 25, 35, and 40 mile zones, only to meet them at the next stop light or sign. Far too many people have a passion for speed without a single thought for safety. On the interstate highways everyone passes me as though I were standing still at 55 miles per hour. What a regard we have for the law of the land!

Capt. Neil D. Judd, USNR (Ret.)
Pittsburgh, PA 15236

A NEW YEAR'S CELEBRATION

Date: 31 December 1985.

Time: 2115. I was thinking of the upcoming morning drive and how I had to get to sleep soon if I wanted to be fresh when I got up at 0415. I also thought about how I would have the second day of the new year off for making this not-too-difficult drive.

Time: 2245. One of my on-base neighbors is having a party. Some of the guests are making it hard to sleep.

Date: 01 January 1986.

Time: 0001. I'm awake! What is that awful racket? Oh, must be the neighbor's party announcing the New Year. Sounds like one half of somebody's kitchen is banging against the other half. Yells and shouts, too. Didn't last too long.

Time: ???? Had a dream in which I saw a white Navy van all twisted and wrecked.

Time: 0415. Alarm clock seems to be attempting to force me into a violent act. I settle for turning it off. Head for the bathroom and my shower.

Time: 0500. My car is parked and locked and the van is warming up. All I need is my passenger and I'll be off.

Time: 0550. My passenger was late. We had to drive to a nearby Air Force base to meet three people arriving on a flight this first day of 1986. I mentioned my dream to him, too. We still had a little way to go, but I was driving very defensively. A few minutes ago a car was heading straight at me in my lane. The headlights of the van flashed and I pulled over. The other driver realized his mistake in time and it wasn't even a near miss. But, it could have been.

Time: 1100. I'm back home and safe and sound. I survived driving in the predawn hours of New Year's Day. The local police were cracking down on drunk drivers. A new seat belt law was in effect and seat belts were getting a large amount of publicity. It seemed that fewer people were drinking and driving this year. I was aware of the danger and drove carefully even though we had a late start. Still, I was wondering: Would it have turned out the same if the trip had been made somewhere in the United States instead of in Japan?

PO1 Gordon VanAlstyne, USN
FPO Seattle, WA 98768

ASBESTOS HAZARD

Enjoyed your article in the February 1986 issue, Delivering Good Brakes. It was informative and contained many good tips which would help assure the safety of anyone performing these tasks. However, since safety and health go hand in hand, you might want to mention the asbestos fiber hazard associated with brake linings and recommend the use of disposable particulate masks while working on brakes. These masks are inexpensive and are usually sold at all locations where spray paint is available.

Larry E. Smith, GM-13
Edwards AFB, CA 93523

Address your letters to:
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DRIVER Magazine
AFISC/SEDD
Norton AFB CA 92409

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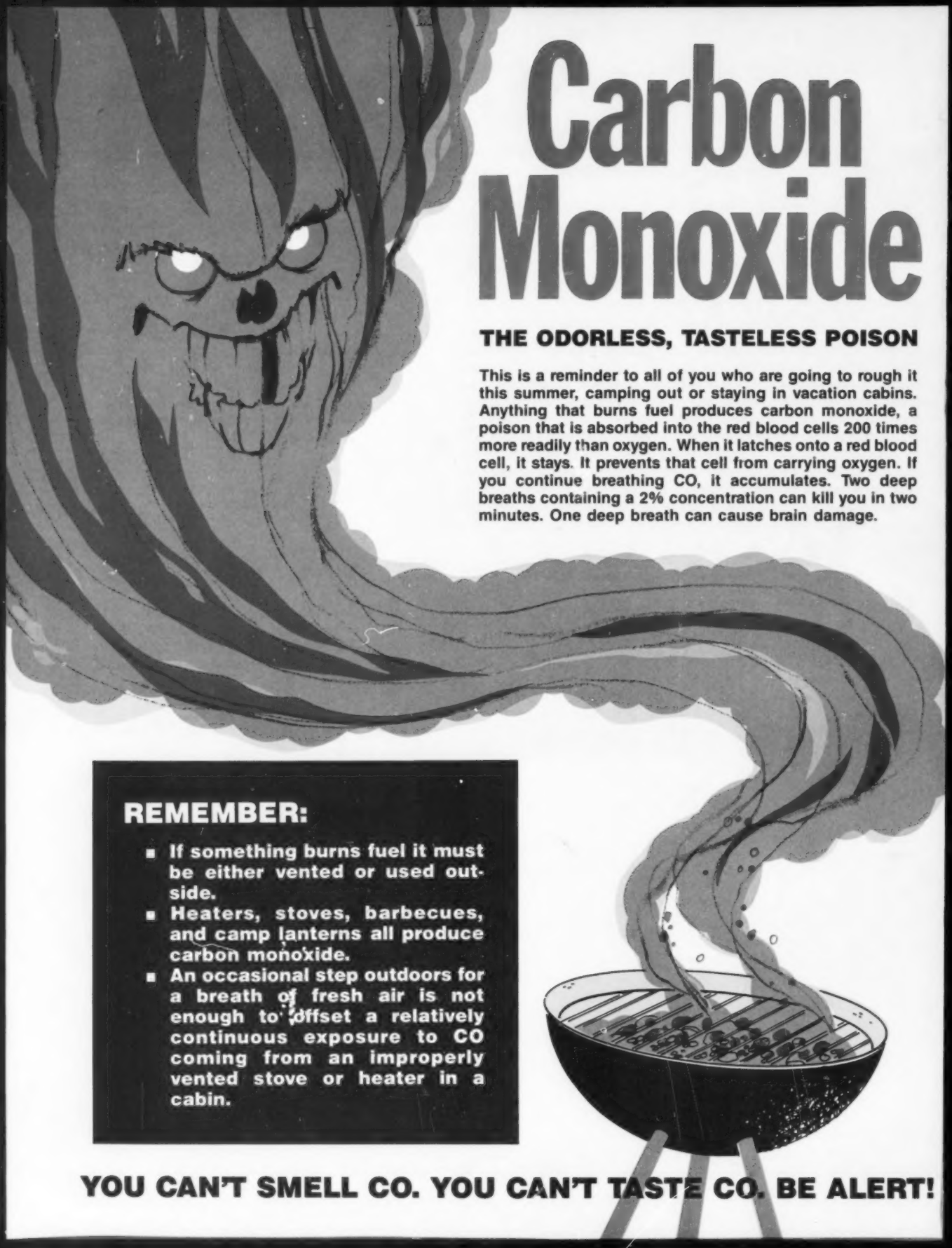

Carbon Monoxide

THE ODORLESS, TASTELESS POISON

This is a reminder to all of you who are going to rough it this summer, camping out or staying in vacation cabins. Anything that burns fuel produces carbon monoxide, a poison that is absorbed into the red blood cells 200 times more readily than oxygen. When it latches onto a red blood cell, it stays. It prevents that cell from carrying oxygen. If you continue breathing CO, it accumulates. Two deep breaths containing a 2% concentration can kill you in two minutes. One deep breath can cause brain damage.

REMEMBER:

- If something burns fuel it must be either vented or used outside.
- Heaters, stoves, barbecues, and camp lanterns all produce carbon monoxide.
- An occasional step outdoors for a breath of fresh air is not enough to offset a relatively continuous exposure to CO coming from an improperly vented stove or heater in a cabin.

YOU CAN'T SMELL CO. YOU CAN'T TASTE CO. BE ALERT!